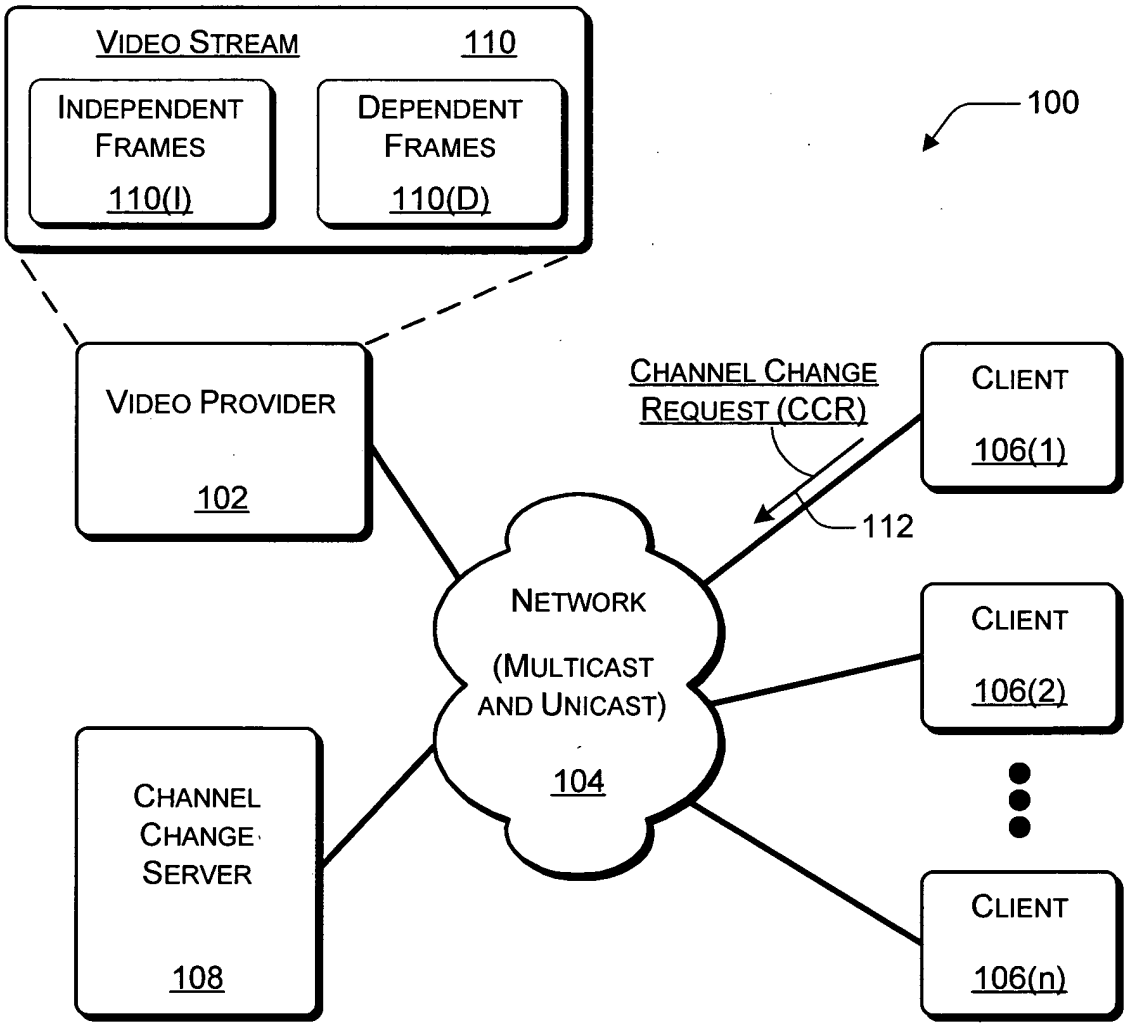
VIDEO STREAM
110
INDEPENDENT FRAMES
110(I)
DEPENDENT FRAMES
110(D)
100
VIDEO PROVIDER
102
CHANNEL CHANGE REQUEST (CCR)
112
CLIENT
106(1)
NETWORK
(MULTICAST AND UNICAST)
104
CLIENT
106(2)
CHANNEL CHANGE SERVER
108
CLIENT
106(n)

FIG. 1

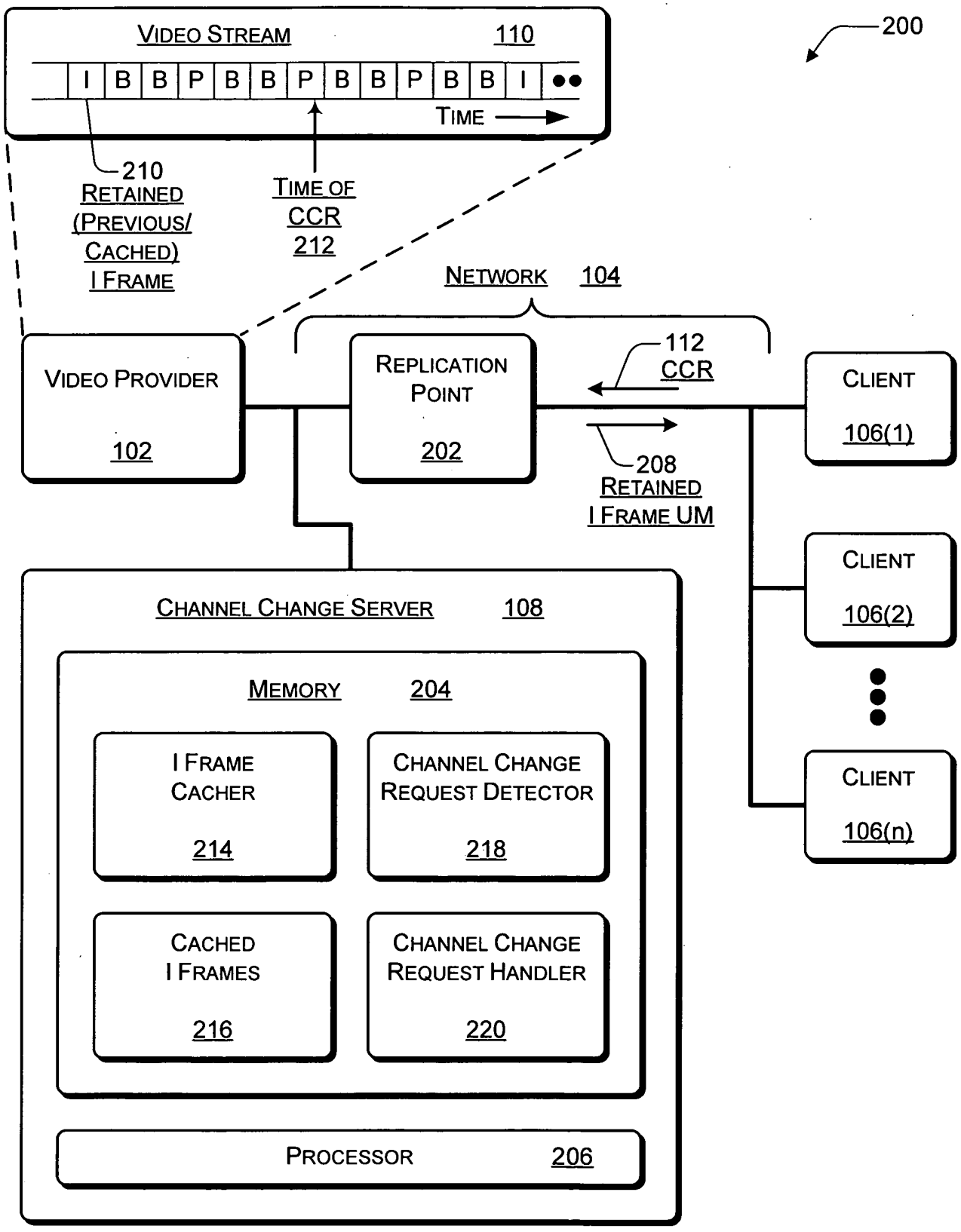
200
VIDEO STREAM 110
I B B P B B P B B P B B I
TIME
210
RETAINED (PREVIOUS/ CACHED) I FRAME
TIME OF CCR 212
NETWORK 104
VIDEO PROVIDER 102
REPLICATION POINT 202
112 CCR
208 RETAINED I FRAME UM
CLIENT 106(1)
CLIENT 106(2)
CLIENT 106(n)
CHANNEL CHANGE SERVER 108
MEMORY 204
I FRAME CACHER 214
CHANNEL CHANGE REQUEST DETECTOR 218
CACHED I FRAMES 216
CHANNEL CHANGE REQUEST HANDLER 220
PROCESSOR 206

FIG. 2

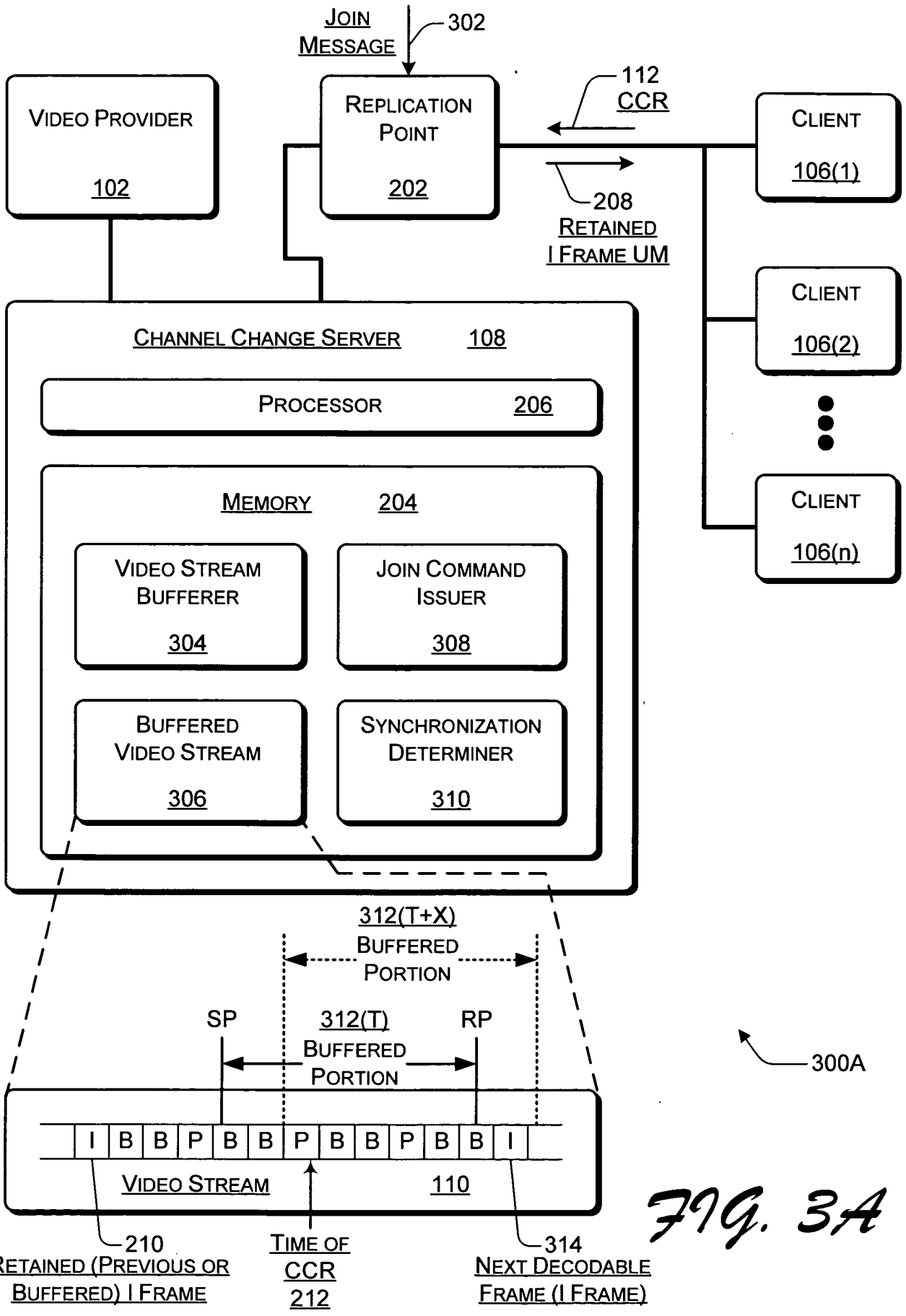
JOIN MESSAGE
302
VIDEO PROVIDER
102
REPLICATION POINT
202
112
CCR
208
RETAINED I FRAME UM
CLIENT
106(1)
CLIENT
106(2)
CLIENT
106(n)
CHANNEL CHANGE SERVER
108
PROCESSOR
206
MEMORY
204
VIDEO STREAM BUFFERER
304
JOIN COMMAND ISSUER
308
BUFFERED VIDEO STREAM
306
SYNCHRONIZATION DETERMINER
310
312(T+X)
BUFFERED PORTION
SP
312(T)
BUFFERED PORTION
RP
300A
I B B P B B P B B P B B I
VIDEO STREAM
110
210
RETAINED (PREVIOUS OR BUFFERED) I FRAME
TIME OF CCR
212
314
NEXT DECODABLE FRAME (I FRAME)

FIG. 3A

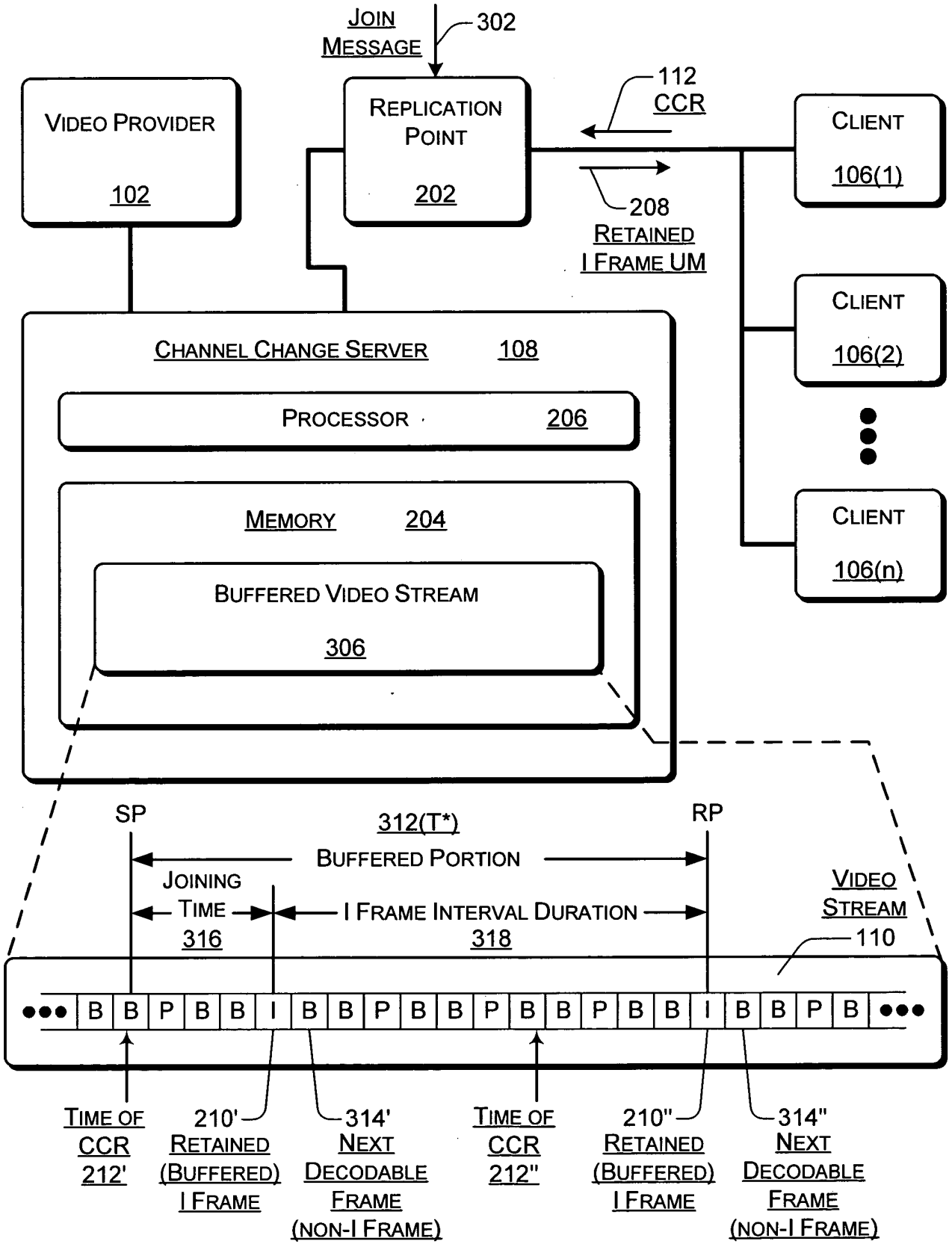
JOIN MESSAGE
302
VIDEO PROVIDER
102
REPLICATION POINT
202
112
CCR
208
RETAINED I FRAME UM
CLIENT
106(1)
CLIENT
106(2)
CLIENT
106(n)
CHANNEL CHANGE SERVER
108
PROCESSOR
206
MEMORY
204
BUFFERED VIDEO STREAM
306
SP
RP
312(T*)
BUFFERED PORTION
JOINING TIME
316
I FRAME INTERVAL DURATION
318
VIDEO STREAM
110
B B P B B I B B P B B P B B P B B I B B P B
TIME OF CCR 212'
210'
RETAINED (BUFFERED) I FRAME
314'
NEXT DECODABLE FRAME (NON-I FRAME)
TIME OF CCR 212"
210"
RETAINED (BUFFERED) I FRAME
314"
NEXT DECODABLE FRAME (NON-I FRAME)

FIG. 3B

300B

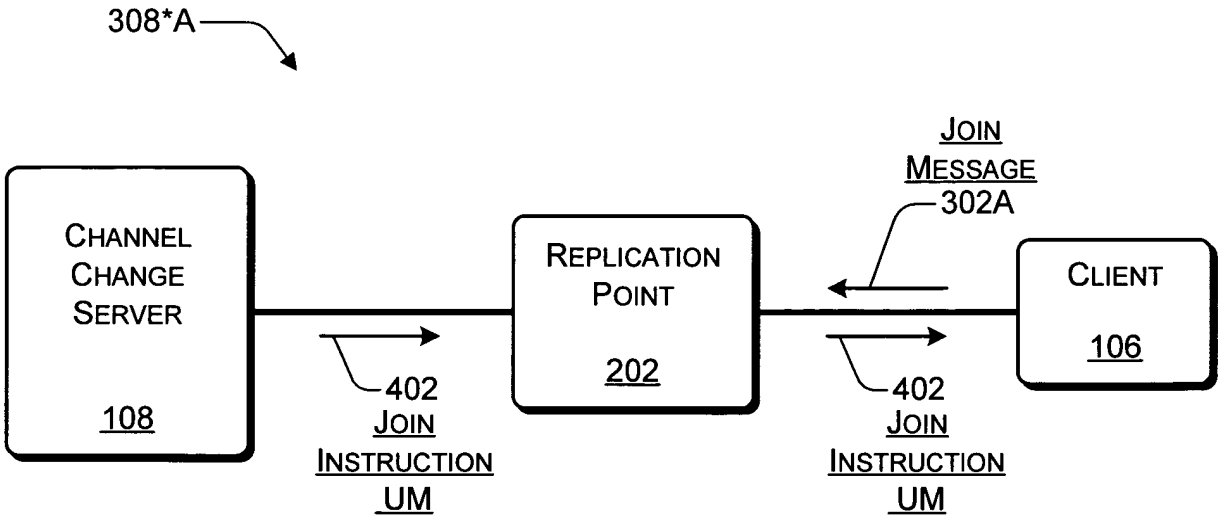
308*A
CHANNEL CHANGE SERVER
108
REPLICATION POINT
202
CLIENT
106
JOIN MESSAGE
302A
402
JOIN INSTRUCTION
UM
402
JOIN INSTRUCTION
UM

FIG. 4A

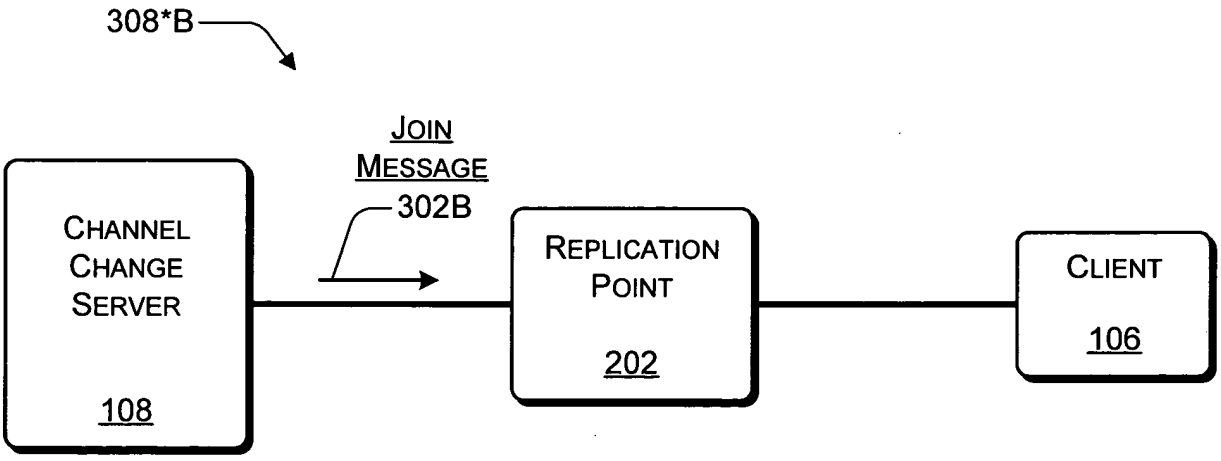
308*B
CHANNEL CHANGE SERVER
108
JOIN MESSAGE
302B
REPLICATION POINT
202
CLIENT
106

FIG. 4B

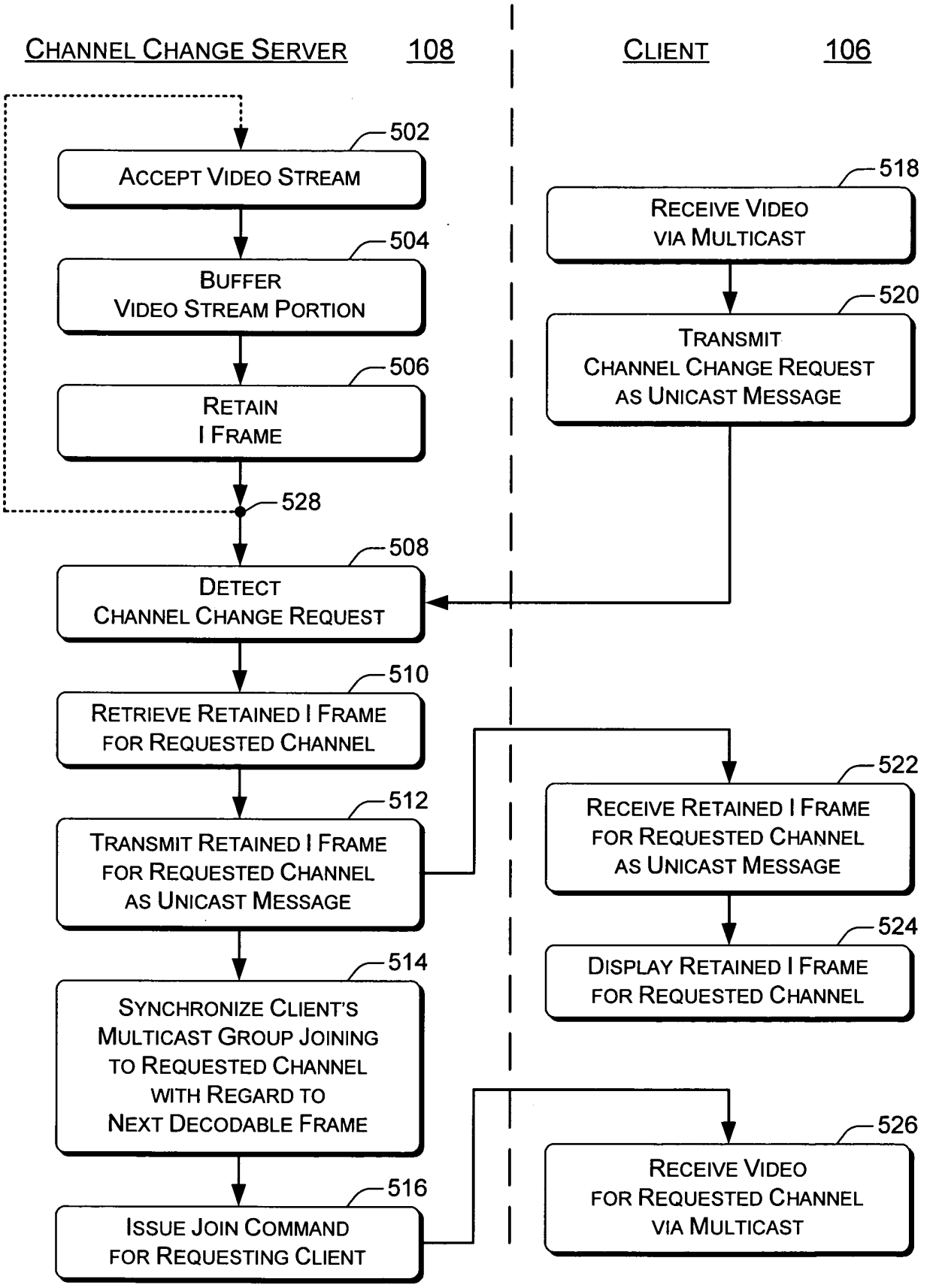
CHANNEL CHANGE SERVER 108
CLIENT 106
502
ACCEPT VIDEO STREAM
504
BUFFER VIDEO STREAM PORTION
506
RETAIN I FRAME
528
508
DETECT CHANNEL CHANGE REQUEST
510
RETRIEVE RETAINED I FRAME FOR REQUESTED CHANNEL
512
TRANSMIT RETAINED I FRAME FOR REQUESTED CHANNEL AS UNICAST MESSAGE
514
SYNCHRONIZE CLIENT'S MULTICAST GROUP JOINING TO REQUESTED CHANNEL WITH REGARD TO NEXT DECODABLE FRAME
516
ISSUE JOIN COMMAND FOR REQUESTING CLIENT
518
RECEIVE VIDEO VIA MULTICAST
520
TRANSMIT CHANNEL CHANGE REQUEST AS UNICAST MESSAGE
522
RECEIVE RETAINED I FRAME FOR REQUESTED CHANNEL AS UNICAST MESSAGE
524
DISPLAY RETAINED I FRAME FOR REQUESTED CHANNEL
526
RECEIVE VIDEO FOR REQUESTED CHANNEL VIA MULTICAST
500

FIG. 5